

## CLAIMS

What is claimed is:

1. A wheel end assembly for a motor vehicle comprising;

a knuckle having a plurality of apertures formed therein for attachment of said knuckle to the vehicle, said knuckle having a generally circular bore formed therein;

a bearing positioned in said generally circular bore, said bearing having an inner race and an outer race;

a wheel hub having a neck portion, in rotational communication with said bearing, and a flange portion attached to said neck portion;

said flange portion having a flange face with an outer portion, an inner portion, and a relief channel disposed between said outer portion and said inner portion;

a plurality of wheel bolt receiving apertures formed in said relief channel each for receipt of a wheel bolt therethrough;

said inner portion and said outer portion of said flange face lying generally in a single plane with said plane being generally parallel to a plane in which a pair of brake mounting structures are disposed;

wherein run-out of said flange face with respect to an axis of rotation of said bearing is minimized to at least 20  $\mu\text{m}$ ; and

wherein said inner portion of said flange face and said outer portion of said flange face have a

flatness of at least 20  $\mu\text{m}$ .

2. The assembly as recited in claim 1, wherein said generally circular bore of said knuckle has an upper snap ring groove and a lower shoulder portion for receiving said bearing therebetween.

3. The assembly as recited in claim 2, wherein a snap ring is positioned in said snap ring groove and wherein said bearing is snap fit into said knuckle between said snap ring and said lower shoulder portion.

4. The assembly as recited in claim 1, wherein said neck portion of said wheel hub is press fit into communication with said bearing.

5. The assembly as recited in claim 1, wherein said bearing outer race is integrally formed with said knuckle.

6. The assembly as recited in claim 1, wherein said bearing inner race is integrally formed with said neck portion of said wheel hub.

7. The assembly as recited in claim 1, wherein parallelism between said inner portion of said flange face and said outer portion of said flange face and a pair of brake caliper ears can be accurately maintained.

8. A knuckle hub assembly for use in a motor vehicle, comprising:

a knuckle having a plurality of apertures formed therein for attachment to a supporting structure, said knuckle having a generally circular bore formed therein;

an attachment structure formed in said knuckle for communicating with a bearing;

a wheel hub having a neck portion and a flange portion, said neck portion being in rotatable

communication with said bearing;

a flange face formed on said flange portion for mating with a brake rotor;

a relief channel formed in said flange face and dividing said flange face into an inner portion and an outer portion which are generally co-planar to each other, said relief channel having a plurality of wheel bolt receiving apertures formed therein for receipt of a wheel bolt therethrough; and

whereby said flange face inner portion is parallel to a first brake caliper and said flange face outer portion is parallel to a second brake caliper and whereby lateral run-out of said flange face with respect to said brake rotor is minimized and wherein said inner portion of said flange face and said outer portion of said flange face have a flatness of at least 20  $\mu\text{m}$ .

9. The assembly as recited in claim 8, wherein said generally circular bore receives said bearing therein and wherein said attachment structure that communicates with said bearing is an inner surface of said bore.

10. The assembly as recited in claim 8, wherein said knuckle bore has an upper snap ring groove and a lower shoulder portion between which said bearing is press-fit.

11. The assembly as recited in claim 8, wherein said bearing has an inner race and an outer race and said bearing outer race is integrally formed with said knuckle.

12. The assembly as recited in claim 8, wherein said bearing has an inner race and an outer race and said bearing inner race is integrally formed with said wheel hub neck portion.

13. The assembly as recited in claim 8, wherein said run-out between said flange face and an axis of rotation of said bearing is minimized.

14. The assembly as recited in claim 13, wherein said run-out between said flange face and said bearing axis of rotation is 14  $\mu\text{m}$  or better.

15. The assembly as recited in claim 8, wherein said bearing is mounted to said attachment structure which is located on an upper portion of said knuckle.

16. A method for manufacturing a knuckle/hub assembly comprising:

providing a wheel hub having a neck portion and a flange portion, said flange portion having a flange face with an inner portion, an outer portion, and a relief channel disposed between said inner portion and said outer portion;

forming a plurality of bolt receiving apertures in said relief channel;

locating a bearing into a generally circular bore formed in a knuckle;

journaling said neck portion of said wheel hub into said bearing to allow rotation of said wheel hub with respect to said knuckle;

final finishing said inner portion and said outer portion of said flange face whereby said inner portion and said outer portion are coplanar and lateral run-out of said flange face to a brake rotor is minimized and wherein said inner portion and said outer portion of said flange face have a flatness of at least 20  $\mu\text{m}$ .